Docket No. 12-0321
ICC Staff Exhibit 10.0

REBUTTAL TESTIMONY

of

GREG ROCKROHR

Energy Engineering Program

Safety and Reliability Division

Illinois Commerce Commission

Commonwealth Edison Company
Annual Formula Rate Update and Revenue Requirement Reconciliation Authorized by Section 16-108.5 of the Public Utilities Act.

Docket No. 12-0321

September 11, 2012

Q. Please state your name and business address.

A. My name is Greg Rockrohr. My business address is 527 East Capitol Avenue, Springfield, Illinois 62701.

Q. Are you the same Greg Rockrohr who previously testified in this docket?

A. Yes. My prepared direct testimony in this docket is ICC Staff Exhibit 5.0.

Q. What is the purpose of your testimony?

A. In my direct testimony, I identified three specific concerns regarding the distribution loss study that Commonwealth Edison Company ("ComEd") filed in this docket as ComEd Exhibit 10.6. My rebuttal testimony describes ComEd's response to these concerns and provides the Commission with my recommendation that it adopt the revised distribution loss study that ComEd filed as ComEd Ex. 17.2.

Q. What, again, is the purpose of ComEd's distribution loss study?

A. ComEd's distribution loss study quantifies the energy lost when ComEd uses its distribution system to supply electricity to its customers. ComEd needs to procure more energy than its customers consume because its transmission and distribution systems are not 100% efficient. ComEd's distribution loss study provides distribution loss factors for customers in each of ComEd's customer categories. To allocate the cost of the extra energy that is lost through use of its distribution system, ComEd's tariffs apply relevant distribution loss factors to the energy consumption of each customer so that each customer pays for the energy ComEd needs to procure for them, including distribution losses. Distribution loss

factors provide a means for ComEd to recover costs associated with the inherent inefficiencies of its distribution system.[1]

Q. Would you please summarize your first concern regarding ComEd's distribution loss study that is identified as ComEd Ex. 10.6?

A. The first concern I identified in my direct testimony relates to ComEd's derivation of secondary and service losses for each customer class. To obtain losses in secondary and service elements, ComEd Ex. 10.6 uses the results of a separate ComEd study, dated June 13, 2012, entitled: "ComEd Secondary and Service Loss Study." [2] My concern is that, for some customer classes, the numbers of customers identified in the tables included in Appendix 1 of ComEd's study do not match the number of customers shown in the corresponding schematic models included as Appendix 2.[3]

Q. How did ComEd respond to your concern regarding these apparent inconsistencies in the appendices of its study?

A. ComEd filed ComEd Ex. 17.1, which is an August 6, 2012 revision to its study entitled: "ComEd Secondary and Service Loss Study". Though the results provided by ComEd Ex. 17.1 are very similar to those in the original version of the study, in ComEd Ex. 17.1 the numbers of customers shown in Appendix 1 appear to correspond to the applicable schematic models included in Appendix 2.

Q. Did ComEd adequately address your first concern?

[1] Staff Ex. 5.0, p. 2.
[2] A copy of ComEd's June 13, 2012, "ComEd Secondary and Service Loss Study" is included as Attachment A to Staff Ex. 5.0 in this proceeding.
[3] Staff Ex. 5.0, pp. 3-4.

A. Yes. With ComEd Ex. 17.1, ComEd adequately addressed my concern regarding inconsistencies between Appendix 1 and Appendix 2 of its study titled: "ComEd Secondary and Service Loss Study."

Q. What was the second concern that you identified in your direct testimony regarding ComEd's distribution loss study?

A. I found that entries in Appendix C to ComEd Ex. 10.6 appeared to be erroneous. ComEd supplies nearly all customers with service elements and some smaller percentage of customers with secondary elements. More customers utilize service elements than secondary elements. Yet ComEd's entries in Appendix C to ComEd Ex. 10.6, entitled: "2011 Loss Factors – Percent of Category Load Through Elements," include several percentages for use of secondary elements that are greater than its use of service elements, which is incorrect.[4]

Q. How did ComEd respond to your concern regarding these illogical entries in Appendix C of ComEd Ex. 10.6?

A. ComEd filed a revised version of its distribution loss study as ComEd Ex. 17.2. ComEd's revised distribution loss study removes the secondary and service elements from the table in Appendix C entitled "2011 Loss Factors – Percent of Category Load Through Elements" and places the percentages for losses in secondary and services, as derived through use of its separate study entitled: "ComEd Secondary and Service Loss Study," in a separate table.

Q. Did ComEd adequately address your second concern?

[4] *Id*., pp. 4-6.

A. Yes. With its revisions to Appendix C that are included in ComEd Ex. 17.2, ComEd adequately addressed the second concern I raised in my direct testimony.

Q. What is your third concern regarding ComEd's distribution loss study?

A. In order to determine ComEd's use of, and losses attributable to, secondary and service elements, ComEd sampled only ten service installations for most customer categories. I am concerned that sampling so few customers in each customer category yields results that may not accurately represent how ComEd actually uses secondary and service elements to supply its customers and not accurately represent ComEd's distribution losses attributable to secondary and service elements.[5]

Q. How did ComEd respond to this concern?

A. ComEd witness Michael Born testifies that he agrees that ten service installations is a small sample for customer categories, but that he believes that the results of ComEd's study are realistic, and that any changes attributable to a larger sample size "would be de minimis."[6] Mr. Born indicates that there is inadequate time in this proceeding to revise the study through use of a larger sample size. Mr. Born further states that between now and its upcoming rate design filing, ComEd will increase the sample size for its four largest customer categories to determine the effect that a larger sample has on study results. ComEd will then present these

[5] Staff Ex. 1.0, p. 6.
[6] ComEd Ex. 17.0, p. 7.

results as part of its rate design filing, which it expects to make in the first half of 2013.[7]

Q. Did ComEd adequately address your third concern?

A. Yes, with respect to this docket. I agree with Mr. Born's assertion that, due to the schedule of this proceeding, there is now likely inadequate time to include a study that incorporates expanded sample sizes in this docket. Mr. Born's proposal to include ComEd's study that incorporates expanded sample sizes in ComEd's upcoming rate design filing is reasonable. To be clear, I continue to believe that a sample of 10 customers from each customer category, out of a population of millions or hundreds of thousands of customer installations per customer category, is insufficient to provide reliable study results. However, given the schedule of this proceeding, I agree with ComEd's suggested approach to address this concern regarding sample size at the time of ComEd's upcoming rate design case.

Q. What is your recommendation regarding ComEd's distribution loss study?

A. The Commission should approve ComEd's use of the distribution loss study filed as ComEd Ex. 17.2. This revised distribution loss study will provide results that are vastly superior to the distribution loss study that ComEd is presently using, largely because it utilizes a more accurate transmission loss study that ComEd completed at the end of 2011 rather than a transmission loss study from the late 1990s.[8]

[7] *Id.*, pp. 6-7.
[8] ComEd's *transmission* loss study, which was performed by Siemens Energy, Inc., was included as ComEd Study Report 7A in Docket 11-0721. The Introduction section from that study, included as Attachment A, explains some of the reasons for significant changes between ComEd's transmission

Q. How do the distribution loss percentages provided by ComEd Ex. 17.2, which ComEd now proposes to use, compare to the distribution loss percentages provided by the distribution loss study that ComEd is presently using?

A. It is my understanding that ComEd is currently determining distribution loss factors through use of the distribution loss study that it filed as ComEd Ex. 67.2 in Docket No. 10-0467. Below is a table that compares the distribution loss percentages identified in ComEd Ex. 17.2 and ComEd Ex. 67.2 from Docket No. 10-0467. The table shows that, for every customer category, the distribution loss percentages provided by ComEd Ex. 17.2 are lower.

ComEd Customer Category	Loss Factor per ComEd Ex. 17.2 Appendix G Docket No. 12-0321	Loss Factor per ComEd Ex. 67.2 Appendix G Docket No. 10-0467	Proposed Change
SF	6.68%	7.61%	-12.22%
MF	7.01%	8.08%	-13.24%
SF-SH	7.47%	8.81%	-15.21%
MF_SH	6.95%	9.32%	-25.43%
WH	6.99%	8.33%	-16.09%
0-100 kW	6.82%	7.61%	-10.38%
100-400 kW	6.22%	7.41%	-16.06%
400-1000 kW	5.51%	6.96%	-20.83%
>1-10 MW	5.50%	6.29%	-12.56%
>10 MW	5.54%	6.34%	-12.62%
HV >=69 kV w_losses	0.82%	0.85%	-3.53%
HV DLF=0	0%	0.00%	0.00%
Railroad	2.52%	3.69%	-31.71%
D-D Lighting	8.93%	11.90%	-24.96%
Gen Lighting	7.72%	10.63%	-27.38%
Muni	0.95%	1.11%	-14.41%
Primary Voltage	3.83%	4.50%	-14.89%
Total Deliveries	5.60%	6.55%	-14.50%

losses in the late 90s and ComEd's transmission losses in 2010.

Q. Does this conclude your prepared rebuttal testimony?

A. Yes.

Section
1

Introduction

Headquartered in Chicago, ComEd is one of the largest electric delivery utilities in the United States and provides service to approximately 3.8 million customers across northern Illinois. ComEd is a transmission owner with extensive electric facilities operated at voltage levels 138 kV and above within Illinois and is a member of the PJM RTO. PJM is the Planning Authority and Transmission Operator for the ComEd transmission system and dispatches the generation located within the ComEd system. The Illinois Commerce Commission (ICC) in its final order in ICC Docket No. 10-0467 required that ComEd provide an updated transmission loss study by the end of 2011. This Transmission Loss Study based on 2010 data was completed to comply with that order.

ComEd's 2010 system peak demand was 21,914 Megawatts (MW) with 103,640,701 Megawatt-hours (MWH) of energy delivered within the ComEd zone. The company delivers energy across a networked transmission system consisting of 138 kV, 345 kV, and 765 kV facilities. The ComEd transmission system has 34 transmission interconnections or tie lines with neighboring utilities. It is interconnected with American Electric Power, American Transmission Company, ITC Midwest, Northern Indiana Public Service Company, Ameren and MidAmerican Energy Company. The large number of interconnection points can increase the impact of loop flows or inadvertent flows across the transmission system and therefore can increase the losses on the transmission system. The municipals within the ComEd system are Winnetka, Rock Falls, Rochelle, St Charles, Batavia, Geneva, and Naperville.

Since the last transmission loss study was completed in 1999 using 1998 data, ComEd's peak load has increased and its interchange patterns have changed significantly. The minimum and peak loads as well as the net interchange at the time of the minimum and peak loads are shown below in Table 1-1. While the minimum load has increased slightly, the peak load has increased 15.3%. The net interchange, however, has increased markedly. The ComEd system still imports power (negative values in the table) into their zone during the peak hour and this import has increased by 23.6% during the peak load hour. The ComEd system exports power (positive values in the table) out of their zone at considerably higher levels now than it did in 1998 during off-peak hours. This is evidenced by the 600% increase during minimum load conditions.

Table 1-1. Minimum and Peak Conditions Comparison between 1998 and 2010

	Loads (MW)		Interchange (MW)	
	Minimum	Peak	Minimum	Peak
1998	7,187	19,012	790	-2,172
2010	7,464	21,915	5,524	-2,685
% Change	3.9%	15.3%	599.2%	23.6%

There have been significant generation changes to the ComEd system since 1998. During that time 5,619 MW of generation has been retired and 11,694 MW of new generation has been built for a net addition of 6,075 MW. Of that net generation addition the great majority of the increase was natural gas and wind generation. The new generation is generally more remote from load centers than the retired generation, so the transmission system has to carry more energy to the load.

Another change since 1998 is that ComEd divested itself of all of its previously owned generation and electric choice has encouraged retail customers to choose alternative electric suppliers. Additionally, ComEd joined PJM in 2004 and the ComEd transmission system became a part of the PJM power market. As an RTO, PJM operates the high-voltage electric grid and manages the wholesale electricity market that serves 13 states and the District of Columbia. ComEd borders the Midwest ISO (MISO) and also is affected by market flows across the MISO system.

In order to maintain system reliability per applicable planning criteria requirements 77 miles of additional 345 kV transmission lines have been added as well as 103 miles of new 138 kV transmission lines. In addition to the new lines that have been constructed, 274 miles of existing 138 kV transmission lines have had their conductor replaced in order to increase their capacity.

The reinforcements to the transmission system make it more robust and increase the capability of transmitting energy from one location to another, as well as generally decreasing overall system losses. However, the changes associated with the generation on the system and especially the increases in system load and net interchange would tend to increase the overall system losses.